

## **II. REMARKS**

### **A. Status**

Claims 1-19 are pending. Claims 1-16 stand allowed. Claims 17-19 stand rejected under 35 U.S.C. §102(b).

### **B. Amendments**

Claim 17 has been amended to more particularly claim that the system of claim 17 comprises a training data set and a software modeler adapted to provide a learning stage. The learning stage comprises modeling a behavior of an electric submersible pump application using at least one deterministic mathematical algorithm based on engineering and physics principles that model the behavior of an electrical submersible pump application, providing the training data set to an initial neural network, and creating a neural network model of a predetermined characteristic of the electric submersible pump application. Additionally, the claimed neural network model of the electric submersible pump application is adapted to generate at least one output related to the predetermined characteristic of the electric submersible pump application for a validation purpose.

Claim 18 has been amended to further note that the adaptable neural network is adapted to be iterated to refine a predicted electric submersible pump application behavior.

No new matter has been added.

### **C. Rejections Under §102**

Claims 17-19 stand rejected under 35 U.S.C. §102(b) as being anticipated by Messatesta. Applicants respectfully traverse.

To anticipate under 35 U.S.C. §102, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001)

Applicants respectfully assert that the amended claims 17 and 18 distinguish the inventions claimed in claims 17-19 over the cited prior art.

Messatesta does not disclose using output of a neural network for validation.

Messatesta does not disclose a software modeler adapted to provide a learning stage, where the learning stage comprises modeling a behavior of an electric submersible pump application using at least one deterministic mathematical algorithm based on engineering and physics principles that model the behavior of an electrical submersible pump application, providing the training data set to an initial neural network, and creating a neural network model of a predetermined characteristic of the electric submersible pump application.

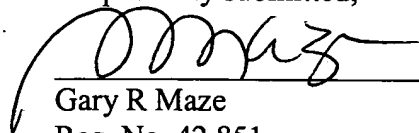
Further, Messatesta discloses a method for forward modeling to produce synthetic tool responses for a well logging tool for an earth formation having one layer or a plurality of two or more layers. It does not disclose modeling an electric submersible pump.

### III. CONCLUSION

In view of the foregoing, Applicants respectfully request an early Notice of Allowance of pending claims 1-19.

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Respectfully submitted,



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**CERTIFICATE OF MAILING 37 CFR 1.8(a)**

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